

VANBIBBER of (W.C.)



MALARIA,

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DR. W. C. VANBIBBER, M.D.

BALTIMORE, MD.

WRITTEN FOR THE

Maryland State Board of Health,

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MALARIA

IN ITS VARIOUS FORMS

AND ITS TREATMENT

BY

WILLIAM D. HARRIS, M.D.

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Malaria or Bad Air.

The subject of malaria is an extensive one. In this paper it will be divided into that malaria which is found in dwellings, showing its effects in domestic life; and into that malaria which spreads over wide districts of country, and shows its effects among the inhabitants of those districts. There are general principles and laws which govern the atmosphere everywhere, whether it is good or bad, and these, it will be seen, have something to do with the question of malaria; but an attempt will be made in this paper to arrive at some conclusions concerning the impurities of the air immediately within the jurisdiction of this State Board of Health.

The meaning conveyed by the word malaria amongst physicians, as well as with the public, has recently undergone some change. Whereas, formerly, the word was kept within the meaning of its derivatives, now, it is not used to express a cause, but as a name of a disease, and that disease is the most prevalent, and may be said to be, the most fashionable one of the day. At the same time it is used as a prefix or adjective, as malario-typhoid or typho-malarial, with the intention to qualify the supposed influence which it exerts on all other diseases, more or less, according to its own peculiar laws. Within my own recollection the word was once more restricted in its application. Less than twenty years ago it was never used in connection with a case of disease which originated, and was treated, in the hilly portion of this state. How different is it now? At present there are cases of disease, found in every locality throughout the state, in what should be well appointed towns, as well as in the country, which are termed malaria, or malarial fever, and for which no other adequate cause or classified name can be found. This is so generally the case, that physicians have been charged by the public with having hobbies, and with using the word malaria as an expression to cover or conceal their ignorance of some unknown cause for those effects which they evidently see before them. This is a serious charge against physicians, and is one which should be explained. If there is any

foundation for this charge, one of three things must be true. Either it must be admitted, that formerly, it was a mistake to restrict the meaning of the word, or that at present, the habits of building and living, are so changed, as to render the extended meaning of it necessary; or else, the physicians must declare that there is an error now in attributing prevailing symptoms to this cause, and calling the disease "malaria." It may be a difficult thing to show which one of these propositions should be accepted, and this difficulty is to be regretted. It would certainly be an interesting and profitable line of inquiry to pursue, to point out the changes which have been made in the personal habits of the people of this state, and to trace the effect of such changes in the resulting health. Changes have been made in the way of warming and ventilating houses, both in town and country. Change in industries, as Dr. Forwood has told us, in the style of living, in the habits as to hours, and in many other ways, all of which might produce that peculiar cachexia which is now called by our physicians and people "malaria." This word has been mentioned as a substantive name of a disease in every paper read before this assembly. A resemblance may be traced in the disease thus named, and an attempted description of real malaria, which will be given further on in this paper; but whether they both depend upon malaria, or bad air, is the point to be determined. It cannot be expected to determine such a point in a paper like this, except by inference. The object here now is to point out where contaminated air may reasonably be expected, and to classify the causes of its contamination. The theories concerning the essence or active principle of malaria are too well known to be recited, and therefore its supposed chemistry or composition will not be discussed. With each one of the sources of malaria as they are mentioned in this paper, so far as it is possible, some remedial means intended for general or popular use, will be suggested.

The malaria found in houses, both in public buildings, and in private dwellings, large and small, called more properly contaminated house-air, and which shows its effects in domestic life, has many sources. In this city the most serious source is from the cess-pools, but this will be mentioned separately. Excluding this, for both city and country, the want of ventilation may be regarded as the next most important. Building houses without fire-places is becoming each year more common. Entire rows of "speculation" houses are built without fire-places, and otherwise badly planned

in regard to ventilation. A large majority of the public buildings, churches, court houses, halls and school houses in the city and country are said to be badly ventilated. A fire place, with a thirteen inch flue in the clear, should be built upon each floor of every dwelling. The Academy of Music, the Natatorium, the Normal School, a few of the public schools in this city, and other buildings also, are completely ventilated, and prove that imperfect ventilation is not a necessity, but results entirely from carelessness. Wet, damp and unclean cellars produce in-door malaria, which permeates most dangerously the entire house. Building houses upon bad ground is another source of malaria within doors, and want of house cleanliness is another. These will all be remedied, one after another, as the bad effects from them are practically demonstrated to the inhabitants; but it is particularly necessary to mention them, in order to keep their importance before the people.

The malaria which is found, and has its origin, outside of dwellings, may be divided into that which is peculiar to cities and large towns, and that which spreads over wider districts. The atmosphere of a city is more readily contaminated than the same area of country land, because the walls and yard enclosures prevent the air from moving through a city with the same freedom of natural currents which it does in the country; when air is partially stagnated, it may be more easily contaminated. The air of a city is deteriorated by the radiation of heat from walls and pavements in summer, and is contaminated from the exhalations from gutters, butcheries and refuse manufacturing products at all times. The air of this city in particular is further contaminated by the exhalations from the earth itself, which holds gases of many kinds in its pores, and is constantly exhaling them into the air which we breathe; particularly is this the case in summer, and more particularly when the earth is dug up in large areas in warm weather. Dr. McShane, of this city, has particularly studied this point, and will give some of his conclusions to the convention. The negligent fitting of gas pipes, permitting leaks, so saturates the earth in many places with burning gas, that some of the finest trees have been killed. All these are undoubtedly sources of malaria. Can they be remedied? Hard as the problem may seem, it would be by no means impossible, provided our citizens would lend a more determined hand in the matter.

To lessen the deteriorating quality of the air from heat radia-

tion, I have elsewhere advised the more general planting of trees and the construction of gardens on the tops of back-buildings, stables, low ware houses, &c., for which kind of building the hills of this city offer peculiar facilities. The variety of trees make a difference, and there is a choice of selection from a considerable number of species. The maple and linden are the kinds most generally selected here, and they are beautiful. The worst city trees, in general use for the streets, are the ash and white mulberry. The most beautiful, in my judgment, are the alanthus, or trees of heaven, and the horse chestnut. The alanthus has been unfortunately discarded from the streets of our city for years, on account of a peculiar aroma from the male tree during two weeks in the month of July. There are certain individuals who say that this aroma gives them headaches. I think in most cases it is purely an imagination concerning the headaches; and it is well known that the female alanthus tree, which is more beautiful than the male, exhales no aroma. The female alanthus is the most beautiful tree suited to our climate that can adorn a city.

For the bad air, and the disease conveying properties of city air, there is one and only one remedy; this is cleanliness. The leaders of government, and the instructors on health, must combine to patiently educate the public how to be clean, and to show them the necessity for it. If the earth in the city exhales bad gases, it is because noxious and putrescent matters are laid beneath it. Can the present state of this evil be remedied in the great city of this state? On account of its geographical situation and its topography, Baltimore should be an exceptionally healthy city. It is in a temperate climate; in a sheltered position; has an abundant market, from land and sea; most of the luxuries of the table are abundant and cheap; a profusion of water, moderate prices for fuel, and every kind of social and agreeable recreation for its citizens. For its topography; it is situated upon hills, from which a grade could have been originally established to deep water, by filling up the intervening hollows, which would have made its surface drainage better than it is now. Much could be done in this way yet by filling up the "submerged district" or "meadow," and draining over its surface to deep water. Yet notwithstanding these advantages, compared with other cities, Baltimore is not an exceptionally healthy city. The published death rate is 18.3 per thousand, and the appearance of its inhabitants do not make it remarkable in respect to health. Why is this so?

I believe that besides the sources of malaria already mentioned, there are two other sources to be discussed, which are worse than all the rest combined. I mean the malaria emanating from the cess-pools and the sewers. Of my own personal knowledge, I can testify, that the Harford run and the Pearl street sewers emit nauseous and even deadly miasms. But the cess-pools are admitted by all persons to be the greatest nuisance which we have. It is an increasing nuisance, for, if bad now, what will it become in the course of time? There are now in Baltimore from fifty-four thousand to sixty thousand houses, and the same number of sinks upon an area of nine thousand six hundred acres. In some places the earth is thickly studded with them. These discharge their gases, at all levels, into the air. To remedy this, I have an idea, and the spirit moves me to proclaim it. The matter is of such paramount importance that it should not be evaded. I know full well the difficulty and the almost hopelessness of the subject. Although I believe you will listen to me with reluctance, and although my mind shrinks from the task, yet I will begin it from a standpoint which may merit both consideration and calculation. The difficulty of the entire subject is owing more to its unpleasant nature, and to a natural loathing from its consideration, than from any real difficulty of bulk or weight, when taken from inventive, engineering or industrial standpoints.

Physiology teaches that an average adult weighing one hundred and forty pounds, requires, in round numbers, about two and a half pounds of solid and three pints or pounds of liquid nourishment in twenty-four hours. From this he passes about two pounds of liquid and less than one-half a pound of solid excreta daily. Is it impossible to remove this, or at least a greater portion of the solid matter? Ask those who know the price of labor if it need be so exceedingly expensive as to condemn it from this item alone. But it requires custom and time to familiarize a population with the idea of a removal of this matter, and it requires the ingenuity of man to collect the material, and after these are overcome then the difficulty will no longer be great. The weight or bulk of the material to be moved is comparatively small. It is for this reason that I believe the best closet has not yet been invented, because, when it is perfected, it will have for its chief object the removal of at least the daily one-half pound per adult capita of solid excreta. Let any one make the calculation for all ages of inhabitants for a city the size of Baltimore. The end of the best

calculation I can make for this entire removal brings the expense down to the one-third of a cent daily for each individual.

It would indeed be a wondrous boon to this city, and to the inhabitants of all the cities of the earth, if this one problem could be solved on the basis of complete removal of solid human excreta. When the small quantity to be removed is known and carefully considered, I trust the day is not distant when it will be accomplished. I have an unfailing confidence in the inventive ingenuity of the free-born American citizen. Does any man believe that the system now in use here is the best that can be devised? It is the truth to say that numberless of our citizens are afraid of their own homes. For one, I feel that when the subject is seriously undertaken with further knowledge and different calculations from those which have maintained heretofore, something more, something different, something better may be done. And to encourage us in this belief, after this paper was written, the *Sanitarian* of the 22d of November, *received to-day*, contains a paper upon "the treatment and utilization of town refuse," by John Collins, F. C. S., F. G. S. L., from which it appears that the town of Bolton, in Scotland, having one hundred and six thousand inhabitants, remove this kind of refuse. Mr. Collins says: "It does not pay expenses, of course, but it costs less than any other plan in operation on a similar scale." He does not give the minutia of the manner of collecting the excreta, but makes these suggestive remarks: "The collection and scavenging are mainly effected at night, and by means of closed carts of excellent design. There are a few water closets, but the *newer* cottage property are provided with 'pails.' These are roughly assorted on loading," &c. This looks as if the elaborate arrangements now in use here would some day or other be substituted by pails or some sufficiently ingenious contrivance to remove and utilize the solid excreta. Where men are crowded together, as in cities, it is necessary to remove the solid excreta daily, and not to hide it forever. I believe it will be easy enough to make way with the liquid excreta, which is easily chemically neutralized.

The last source of malaria to be mentioned is that which affects the inhabitants of the low lands, or the cretaceous, the tertiary and the post tertiary lands, of this state. It is known to us as that malaria which pervades large districts of territory. Its essence is not known. From the earliest days of medicine it has been supposed to produce ague-and-fever. Elsewhere, in a report upon the drinking waters of Maryland, I have spoken of the investi-

gations of others in seeking for the cause of ague-and-fever in the drinking waters of the flat lands. This is an interesting subject; but as it is yet undetermined concerning the water, it is fair at present to hold that if ague-and-fever is conveyed into the human system through the air, that this is the great and prevalent out of doors malaria of which this State Board of Health has charge. We have all seen type cases of long continued or chronic ague-and-fever which have originated in this state. Let us suppose one particular case of an adult, who has had the disease since childhood, and he will present upon examination these prominent appearances and symptoms. In figure he may be taller than the average height, gaunt, thin and bony; with a muddy, ugly complexion, without tint or color; awkward in motion, slow in speech and action; slow in cerebration, ignorant, superstitious, untidy; always thinking of himself and his diseases; will talk by the hour of his chills and fevers, when they come on and when they pass off; will take any quantity of quinine, blue-mass, calomel, cholagogue or any advertised remedy; but is so fond of his home and neighbors in like affliction, that he will never leave it, or them. A most prominent symptom of his malady is that he will take no advice, and refuses to appreciate anything like advancement. Should this adult die suddenly, or, as often happens, die from some intercurrent disease, as pneumonia, the skilled pathologist will pronounce his liver different from the physiological liver in color, consistence and size. His spleen will be found large, soft and pulpy, and his blood changed in color and in microscopic appearance.

This type case of old-fashioned malaria, with some sectional differences, has been found in all parts of the world, between certain parallels of latitude, wherever our navies have gone. It is common on both the east and west coasts of North and South America, and in the adjacent islands; on the coasts of Africa, Asia, and on the shores of the Mediterranean Sea, and also in the river bottoms and swamplands of these several continents. This is the wide-spread out-of-doors malaria, well-known in medical as well as general literature. For its habitat and gravity in our own state and country one can consult the map issued by the census bureau in 1870. If this is a fair description of the disease in question, however imperfectly it is drawn, and if this board of health has even indirect charge or self-imposed responsibility concerning those suffering with this affection, is it not an interesting theme to them? Is it not a pleas-

ant duty to promulgate knowledge, and ways and means by which these terrible sufferers may be relieved, if it is possible? To relieve them would be even more than equal to the work of Jenner, or like the rite of Apotheosis amongst the ancients.

Whether this disease comes from a malaria over the land or from germs in the water, the best means that I know to prevent ague-and-fever (nothing need be said here of its cure), are these: Temperance in eating and drinking, and avoiding during summer entire suits of linen clothes as a summer wear; drying the air of a sleeping room by fire, night and morning; building dwelling houses above the earth, in order to give an air circulation between the earth and the house; avoiding the night air out of doors in certain places; filtering and boiling drinking water; cleanliness about houses and yards; drainage from the premises; high trimming of trees around houses on sides facing healthy localities; and the removal of all stagnant waters from the neighborhood of dwellings. In a report made to this board of health in 1878, I suggested sprays of carbolic acid to be industriously applied during three months in the year in the houses where chills are known to prevail. All these means are easily enough carried out, and if they will prevent this terrible disease, are fully worth the trouble they will give.

I must be permitted to say here that it is not derogatory to the medical profession, as a body, that they cannot positively assert what is the peculiar principle or essence in the air, if it is in the air at all, by which fever-and-ague is conveyed into the human system. On the contrary, it is a credit to the profession, as a body, that, notwithstanding previous disappointments, many of its members are still diligently searching to find this unknown cause; and who will doubt that, in time, it will not be discovered?

In this paper I have endeavored to be practical in what suggestions were made. It was prepared with the hope that it might prove useful in calling the attention of some of our citizens to points which may not have occurred to them amidst their own special labors and occupations. By this I thought to fulfill the wishes of the board, who invited me to prepare it. I have not entered into the theories, the philosophy, or the science of causes, of malaria. I have not attempted to describe the micro-organisms, which are supposed to produce it, because I had nothing to add, from my own researches, to what is already known on the subject, and in this case it is better to leave such discussions to the universities, where they properly belong.

